Technical Note – TN-4
Issue: 4 December 2025

Installation of RSGH Strain Gage Rosettes with Cyanoacrylates

Introduction

These instructions establish the procedure for installing Piezo-Metrics' semiconductor strain gage rosettes to metallic surfaces using a cyanoacrylate adhesive.[1]

Required Materials

1 – fine-tipped tweezers, e.g. Excelta 3C-SA
1 – bottle/squeeze tube of cyanoacrylate with fine tip, e.g. M-Bond 200
1 – pack of lint-free wipes
1 – bottle of isopropyl alcohol (IPA)
1 – 600 micro-grit sandblaster or 600 grit wet-dry sandpaper
1 – fine-tipped marker
1 – glass plate
1 – roll of Scotch Transparent Tape or equivalent
1 – roll of 1 mm dia. solder with flux
1 – 18 W soldering iron, e.g. Antex Model 3/GU
1 – 1.0 mm dia. solder tip, e.g. Antex Model 6-NS
1 – bottle/tube of silicone rubber, e.g. M-Coat C
1 – 10X stereo microscope

A. Surface Preparation[2]

A.1 Lightly sandblast the gaging area with 600 micro-grit to remove surface oxides. The surface should have a uniform, velvety texture at the completion of sandblasting. Alternatively, 600 grit or finer wet-dry sandpaper can be used.

A.2 Thoroughly clean the gaging area with IPA. All degreasing should be done with uncontaminated solvents and lint-free wipes. First, scrub surface with IPA-soaked wipes. Continue scrubbing with new IPA-soaked wipes until the wipes remain clean. Then, with

[1] **Important Note**
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[2] Content has been adapted from Micro-Measurements Instruction Bulletin B-127.

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a new IPA-soaked wipe, sweep the gaging area in one direction only so that contaminants are not re-deposited in the gaging area.

A.3 Allow the gaging area to dry thoroughly.

A.4 Mark reference lines on the structure to be gaged with a fine-tipped marker to show where the rosette will be bonded. The references lines should be drawn so that they aid in determining both the position and orientation of the rosette during its installation.

B. Rosette Bonding[3]

B.1 Bond the rosette with the aid of a 10X stereo microscope.

B.2 Place the structure under the microscope and secure it temporarily so that it does not move during the rosette installation.

B.3 Open the bottle of cyanoacrylate and ensure that the dispensing tip can meter out a single drop of adhesive.

B.4 Take the rosette out of its shipping package using a fine-tipped tweezer. Be careful not to grab onto the strain gages on the rosette.

B.5 Place the rosette face up on the glass plate.

B.6 Center and then gently lay a 125 mm (5 inch) long piece of Transparent Tape on the rosette.

B.7 Use the blunt end of the tweezers to gently smooth the tape over the terminal pads of the rosette. The tape must seal the terminal pads to prevent the M-Bond 200 from flowing onto their surfaces. If M-Bond 200 is present on the terminal pads, it will prevent the solder from sticking to the terminal pad. Do not smooth the tape over the strain gages. See Figure B1.

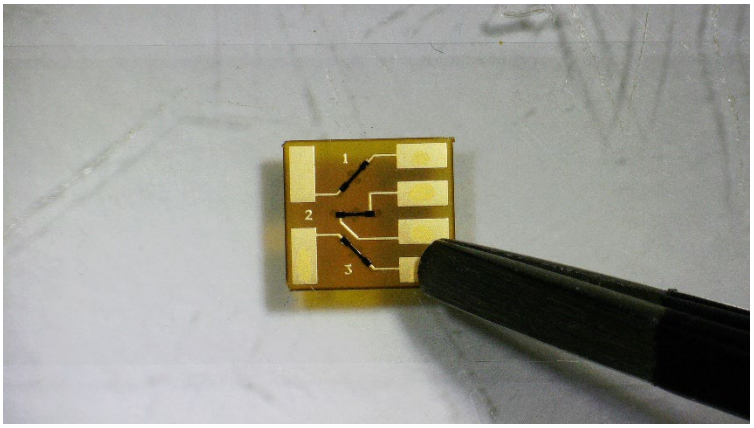

Figure B1 – Sealing rosette terminal pads.

B. 8 Lift the tape at a shallow angle, about 30 to 45 degrees to the plate surface, to lift the rosette off the plate.

[3] Content has been adapted from Micro-Measurements Instruction Bulletin B-127.

B.9 Center the rosette over the reference marks on the structure and tape one end of the tape to the structure to within 3 mm (1/8 inch) of the rosette's edge. Roll the free end of the tape backwards towards the point where the first end was taped down and tack it down on the structure. The bottom of the rosette will be facing upwards and outwards. See Figure B2.

B.10 Fold a lint-free wipe into a small rectangular pad.

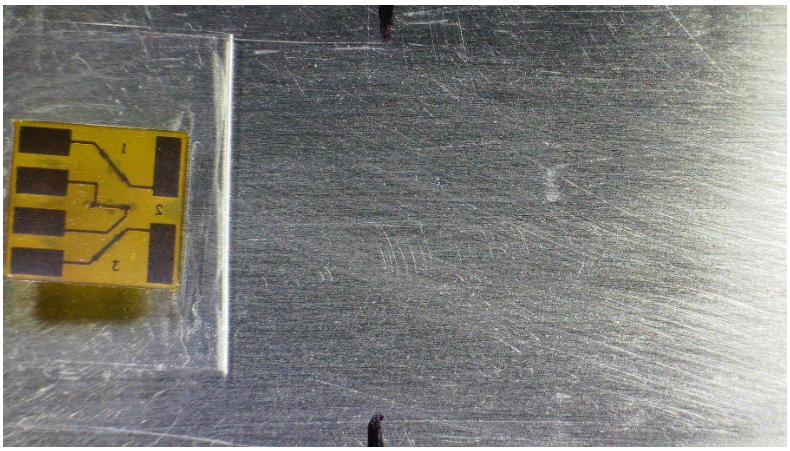

Figure B2 – Rolling back tape to expose back of rosette.

B.11 Apply a very thin amount of M-Bond 200 Catalyst on the back of the rosette per the manufacturer's instructions. Allow it to fully dry.

B.12 Take the container of cyanoacrylate and place a single drop of adhesive at the intersection between the tape and the structure. The drop will spread across the intersection. It should cover approximately the width of the rosette. See Figure B3.

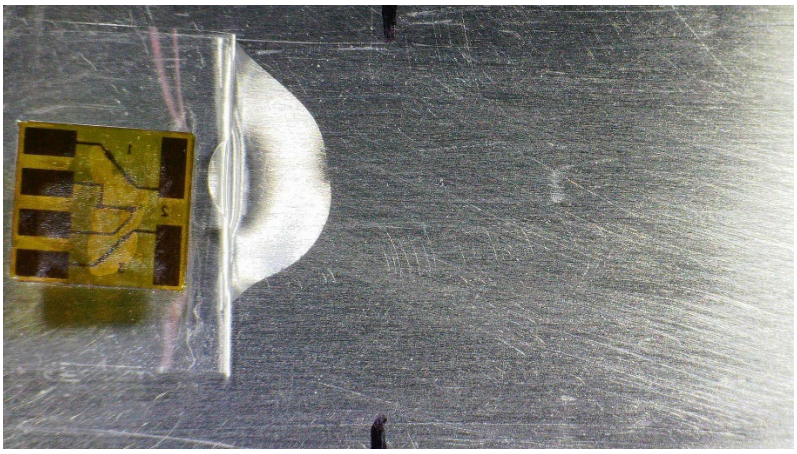

Figure B3 – Application of drop of adhesive.

B.13 Free the tacked-down end of the tape in preparation of rolling it forwards into the M-Bond 200. Position the rectangular pad near the tape-structure interface.

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B.14 Press the rectangular wipe pad down firmly and sweep it forwards to squeeze the M-Bond 200 along the tape-structure intersection as the tape rolls forward into the structure's surface. It is important that the M-Bond 200 be allowed to fully cover the back of the rosette to obtain a full-coverage, uniform bondline.

B.15 Once the M-Bond 200 has been swept past the rosette, press down on the rosette with one finger and hold firmly for 90 s. Wait another 90 seconds before removing tape.

B.16 To remove the tape, fold the free end back over itself 180 degrees so that the adhesive side is facing upwards. Slowly peel the tape back over itself.

B.17 The completed installation should have terminal pad surfaces that are free of adhesive. See Figure B4.

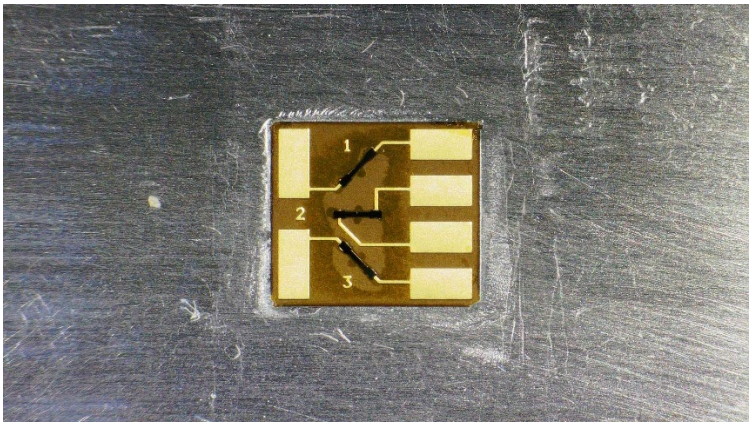

Figure B4 – Installed rosette.

C. Instrumentation Cable Soldering

C.1 The instrumentation cable conductors should be 26 AWG or smaller.

C.2 Strip 2 mm or 1/16 inch of insulation off the conductor.

C.3 Allow the soldering tip to reach operating temperature.

C.4 Ensure that the tip is tinned and extremely clean and free from carbon residue.

C.5 Tin the ends of the cable conductors.

C.6 Melt a very small quantity of solder onto the solder tip.

C.7 Place the solder tip on the rosette's solder pad and sweep the tip the length of the solder pad. The solder should flow freely and result in a thin layer of solder on the pad. See Figure C1.

C.8 If too much heat is applied to the rosette's copper pad, the pad will debond from the rosette substrate and render the strain gage inoperable.

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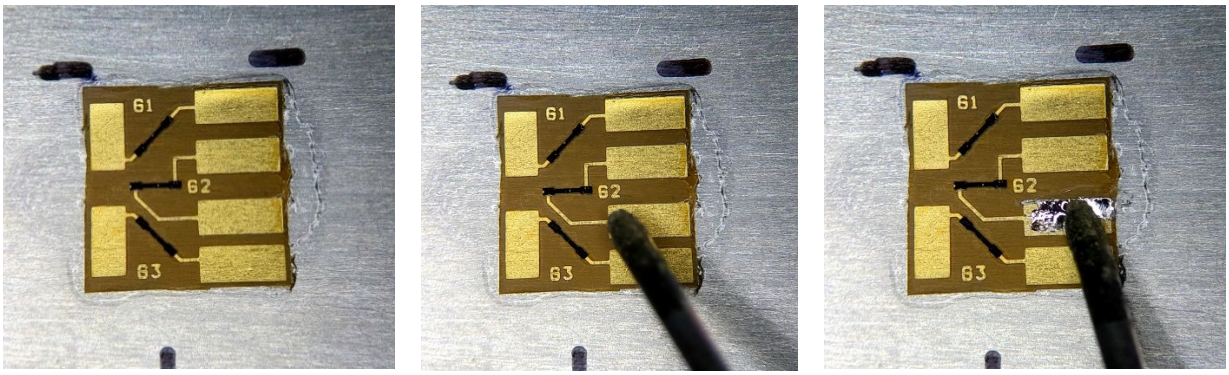

Figure C1 – Applying solder to solder pad.

C.9 Position the conductor so that it is in direct contact with the pre-tinned copper pad on the rosette. Ensure that the conductor is secured to structure so that it does not move.

C.10 Apply just enough heat to melt the solder on the conductor and the solder on the copper pad.

C.11 CAUTION: If too much heat is applied to the conductor, the copper pad will debond from the rosette substrate and render the strain gage inoperable.

C.12 Verify the resistance of each strain gage on the rosette. The gage resistances should be within 5% of the average rosette gage resistance.

C.13 CAUTION: Avoid pulling on or lifting up the conductor afterwards. These forces may cause the solder pad to peel off and render the strain gage inoperable.

D. Application of Protective Coating

D.1 Gently clean any solder flux residue from the conductors with IPA and a lint-free wipe.

D.2 Apply a protective coating over the entire rosette and solder joints in thin layers. Allow sufficient time dry between layers.

D.3 Secure the conductors to the structure with a tie-wrap strap or similar for strain relief.

E. Additional Information

Rosettes bonded with M-Bond 200 can operate in temperatures between –20C and +55C.

F. Additional Information

For more information about any of the topics discussed in this Technical Note, please visit the Piezo-Metrics website at www.piezo-metrics.com and enter questions into the Customer Service Agent. Questions can be similar to:

‘tell me more about semiconductor strain gage rosettes’

‘tell me more about semiconductor strain gages’

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